



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/689,680 | 10/22/2003 | Masayuki Motonari | 244104US0X CONT | 4922 |
| 22850 | 7590 | 02/01/2005 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | TRAN, BINH X | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1765 | |

DATE MAILED: 02/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/689,680 | Applicant(s) MOTONARI ET AL. | |
| | Examiner Binh X Tran | Art Unit 1765 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/816,397.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>10/22/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

2. Claim 26 is objected to because of the following informalities: In lines 9-10 of claims 26, the examiner suggests applicants replace "(meth)acrylamide" with --methacrylamide-- (i.e. delete the parenthesis) . Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 26-27, 30-32, 34-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (US 6,416,685).

Respect to claim 26, Zhang discloses a chemical mechanical polishing method comprising the step of polishing an interlayer insulating film (i.e. FLARE™, polyarylene

Art Unit: 1765

ether) with an elastic modulus of 3 GPa (col. 9 lines 20-40) using an aqueous dispersion which comprises a scratch inhibitor (i.e. surfactant) and an abrasive comprises organic/inorganic composite particle comprises an organic particle (col. 10 lines 1-25; col. 11 line 13-15, Table A) and inorganic particle (col. 11 lines 10-13) attract to each other to form polymer-coated particles. This would reads on the limitation zeta potentials of opposite signs bonded by electrostatic force. Zhang does not explicitly disclose that the nanoindentation method is used to measure the elastic modulus of the insulating film. However, Zhang discloses the elastic modulus of 3 GPa for the insulating film (within applicant's range of "no greater than 20 GPa"). Elastic modulus is a property of material itself. The specific method to measure a property of a material (i.e. elastic modulus) will not have any patentable weight and will not result a change to the material itself.

Respect to claim 27, Zhang discloses the surfactant is non-ionic surfactant including polyoxyethylene alkyl ether (col. 11 lines 40-43). Respect to claims 30-31, Zhang discloses the aqueous dispersion further comprises an oxidizing agent includes hydrogen peroxide (col. 11 lines 32-33). Respect to claim 32, Zhang discloses the aqueous dispersion further comprises an organic acid (col. 11 lines 23-26). Respect to claim 34, Zhang discloses the abrasive is present is the range of 1-10% (Fig 3). Respect to claims 35, Zhang discloses to adjust the pH from acidic side (pH less than 7) to basic side (greater than 7) using appropriate chemical (read on applicant's range of pH from 2 to 12; See col. 7 lines 38-41).

Claim Rejections - 35 USC § 103

Art Unit: 1765

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang as applied to claim 26 above, and further in view of Kaufman et al. (US 6,217,416).

Respect to claim 33, Zhang teaches to use scratch inhibitor including surfactant and other additives (Table A, col. 11). However, Zhang fails to disclose the specific concentration of scratch inhibitor. In a polishing method, Kaufman teaches to use scratch inhibitor includes thiourea and surfactant. Kaufman further discloses the concentration of thiourea ranges from 0.01-0.1 wt % (col. 6 lines 30-45) and surfactant concentration ranges from 0.001 to 0.1-wt% (col. 6 line 59 to col. 7 line 5, within applicant's range). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Zhang in view of Kaufman by using scratch inhibitor

Art Unit: 1765

including surfactant and thiourea within the suggested weight percentage because it helps to stabilize the dispersion and preventing wet etching of the substrate surface.

8. Claims 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang as applied to claim 30 above, and further in view of Grover et al. (US 6,689,692).

Respect to claim 36, Zhang teaches to use oxidizing agent. However, Zhang fails to disclose the specific weight percentage of the oxidizing agent in the aqueous dispersion. In a chemical mechanical polishing process, Grover teaches that oxidizing agent in the range of 0.05 to 5.0 wt%, more preferable 0.1-2.0 wt% is useful to control the selectivity of the polished layer (col. 4 lines 25-35, within applicant's range). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Zhang by using the oxidizing agent with weight percentage value as discussed above in order to control the selectivity.

Allowable Subject Matter

9. Claims 28-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: The cited prior arts fail to disclose or suggest that the scratch inhibitor is 7-hydroxy-5-methyl-1,3,4-triazaindolizine or the scratch inhibitor comprises a combination of a compound selected from the group consisting of -hydroxy-5-methyl-1,3,4-triazaindolizine, and 5-amino-1H-tetrazole and a non-ionic surfactant in conjunction with all other limitations in the claim.

Art Unit: 1765

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X Tran whose telephone number is (571) 272-1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Binh Tran

Binh X. Tran